

Fiat lux, let there be light!

John Mather, January 21, 2015

Most of us think of light as helping us see things, but it is so much more important than that. Light is electromagnetic energy moving in waves through space, interacting with atoms and molecules as it goes. So are radio waves, microwaves, infrared light, ultraviolet, x-rays, and gamma rays – all of them are electromagnetic energy, and the only real difference is the spacing between the wave crests. So light gives us communications with each other with radio and TV, and it gives us the ability to travel through the universe using telescopes and our imagination. But light also gives us access to scientific questions, such as: what holds the atoms and molecules together? How does the mysterious quantum mechanics work? And understanding all these, how can we build electronic devices for modern life? And if we are very ambitious, we build accelerators like the Large Hadron Collider, and particles collide and concentrate electromagnetic energy into tiny spaces, and according to Einstein's $E=mc^2$, we turn energy into new particles to learn, perhaps, what the universe was like when it was a tiny fraction of a second old.